

A request for a three-month extension of time to respond is included herewith along with the required fee. This three-month extension will bring the due date to August 26, 2001, which is within the six-month statutory period. Should such request or fee be deficient or absent, consider this paragraph such a request and authorization to withdraw the appropriate fee under 37 C.F.R. §§ 1.16 to 1.21 from Williams, Morgan & Amerson, P.C. Deposit Account No. 50-0786/2039.010700RFE.

Reconsideration of the application in view of the following amendments and remarks is respectfully requested.

AMENDMENT

In the claims:

Amend claim 25 to read as follows:

25. (Amended) A method of producing a composition comprising a highly oxidatively stable polyalphaolefin and a diphenylamine antioxidant, comprising the step of hydrogenating polyalphaolefin to a level of hydrogenation in which an RBOT level of at least 2200 minutes is achieved.

REMARKS

1. Status of claims

Claims 1-28 are pending.

2. Support for amendment

The amendment of claim 25 finds support in the specification at p. 8, line 9 through p. 9, line 15. A copy of the amended claim, with insertions and deletions marked, can be found in the Appendix.

3. Claim rejections under 35 U.S.C. §112, second paragraph

Claims 25 and 26 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Specifically, the Examiner alleges that claim 25 is indefinite for using the phrase “when diphenyl amine is used as an antioxidant,” and claim 26 is indefinite for reciting “Lube Oil Oxidator Level.” Applicants respectfully traverse this rejection.

Claim 25 has been amended above to clearly state that it relates to a method of preparing a composition comprising a highly oxidatively stable polyalphaolefin and a diphenylamine antioxidant. The method comprises the step of hydrogenating the polyalphaolefin. One of ordinary skill in the art would recognize that the claim, as written, encompasses the addition of the diphenylamine to the polyalphaolefin composition either before, during, or after the hydrogenating step. Therefore, Applicants believe claim 25 particularly points out and distinctly claims the subject matter recited therein, and the rejection should be withdrawn.

Claim 26 recites a limitation determinable by performing a Lube Oil Oxidator measurement. The Lube Oil Oxidator measurement is described at p. 12, lines 18-23. Therefore, Applicants believe claim 26 particularly points out and distinctly claims the subject matter recited therein, and the rejection should be withdrawn.

4. Claim rejections under 35 U.S.C. §102

Claims 13-24 are rejected under 35 U.S.C. §102(b) as being anticipated by Wu et al., U.S. Pat. No. 5,276,227 (“Wu”). Specifically, the Examiner alleges Wu discloses a polyalphaolefin composition having a Bromine Index of less than 200. Applicants respectfully traverse this rejection.

The Examiner points to Wu, col. 3, lines 46-51, as disclosing polyalphaolefins having “a low bromine number, usually lower than 4.” In terms of Bromine Index, the polyalphaolefins of Wu would thus have a Bromine Index usually lower than 4000 mg per 100 g polyalphaolefin. In other words, Wu discloses polyalphaolefin compositions having a range of Bromine Indices, wherein the lower limit of the range is less than 4000. However, Wu does not disclose what that lower limit is.

The present claims are limited to polyalphaolefins with a Bromine Index of 200 or fewer mg per 100 g polyalphaolefin. Because Wu does not disclose a Bromine Index value of 200 or less, the conditions set forth for anticipation of ranges in MPEP 2131.03 are not met. Specifically, Wu does not provide a specific example within the claimed range, and Wu does not disclose a range which touches, overlaps, or is within the claimed range. Therefore, Wu does not anticipate claims 13-24, and therefore the rejection should be withdrawn.

5. Claim rejections under 35 U.S.C. §103

Claims 1-8, 10-12, and 27 are rejected under 35 U.S.C. §103(a) as being unpatentable over Sauer, U.S. Pat. No. 3,113,167 (“Sauer”). Specifically, the Examiner alleges that Sauer discloses a process for producing polyalphaolefins involving a distillation step followed by a hydrogenation step, and that, despite the absence of a teaching by Sauer of hydrogenating to a

Bromine Index of less than 200, it would be obvious to one of ordinary skill in the art to hydrogenate to a Bromine Index of less than 200 as is presently claimed. Applicants respectfully traverse this rejection.

The present claims recite hydrogenation of the polyalphaolefin to a Bromine Index of 200 or less, i.e., the polyalphaolefin has sufficient unsaturation that no more than 200 mg Br can add across the carbon-carbon double bonds of 100 g polyalphaolefin. 200 mg Br (as diatomic Br₂) represents about 1.25 mmol Br₂. 100 g polyalphaolefin (mostly saturated) represents about 3.5 mol of -CH₂-CH₂- and -CH=HC- units. In other words, the polyalphaolefin of the present claims is no more than about 0.036% (1.25 mmol/3.5 mol) unsaturated. Sauer does not teach hydrogenating to such a low level of unsaturation, and such a level of unsaturation is so much lower than any disclosed by the art of record that it cannot be suggested by Sauer. The Examiner is invited to consider the teaching of Wu, which far postdates the teaching of Sauer and can be considered a summary of the state of the art, which teaches hydrogenation only to about a Bromine Number of 4 (or Bromine Index of 4000, which is 20-fold greater than the upper limit of the range recited by the pending claims). If Wu could not identify a greater extent of hydrogenation, one of ordinary skill in the art would conclude that Sauer could not have reached a greater extent of hydrogenation either.

Because Sauer neither teaches nor suggests hydrogenating a polyalphaolefin to a Bromine Index of 200 or less, it cannot render claims 1-8, 10-12, and 27 unpatentable, and the rejection of these claims should be withdrawn.

Second, claims 1-4, 6-12, and 26 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cupples et al., U.S. Pat. No. 4,282,392 ("Cupples"). Specifically, the

Examiner alleges that Cupples discloses a process for producing alphaolefin oligomers comprising a hydrogenation step followed by a distillation step, and that, despite Cupples' failure to teach hydrogenating to a Bromine Index less than 200, it would be obvious to one of ordinary skill in the art to hydrogenate to a Bromine Index of less than 200 as is presently claimed. Applicants respectfully traverse this rejection.

As stated above, the present claims recite hydrogenation of the polyalphaolefin such that the polyalphaolefin of the present claims is no more than about 0.036% unsaturated. Cupples does not teach hydrogenating to such a low level of unsaturation, and such a level of unsaturation is so much lower than any disclosed by the art of record that it cannot be suggested by Cupples. In light of Wu as described above, one of ordinary skill in the art would conclude that Cupples could not have reached an extent of hydrogenation such that the Bromine Index would be 200 or less.

Because Cupples neither teaches nor suggests hydrogenating a polyalphaolefin to a Bromine Index of 200 or less, it cannot render claims 1-4, 6-12, and 26 unpatentable, and the rejection of these claims should be withdrawn.

Third, claim 28 is rejected under 35 U.S.C. §103(a) as being unpatentable over Cupples in light of Wu, as described above. Applicants respectfully traverse this rejection.

As stated above, the present claims recite hydrogenation of the polyalphaolefin such that the polyalphaolefin of the present claims is no more than about 0.036% unsaturated (i.e., the polyalphaolefin has a Bromine Index of 200 or less). Neither Cupples nor Wu teach or suggest hydrogenating to such a low level of unsaturation, for the reasons described above. One of

ordinary skill in the art would conclude that neither Cupples nor Wu reached an extent of hydrogenation such that the Bromine Index would be 200 or less.

Because neither Cupples nor Wu teaches or suggests hydrogenating a polyalphaolefin to a Bromine Index of 200 or less, their combination cannot teach or suggest such a method step either. Therefore, claim 28 is patentable over Cupples and Wu, and the rejection of this claim should be withdrawn.

Finally, claim 25 is rejected under 35 U.S.C. §103(a) as being unpatentable over Cupples or Sauer in view of Van Dyck Fear, U.S. Pat. No. 2,980,603 ("Fear"). Cupples and Sauer have been discussed above. The Examiner alleges Fear supplements Cupples or Sauer by teaching the use of a diphenylamine as an antioxidant, and thus renders the claim unpatentable. Applicants respectfully traverse this rejection.

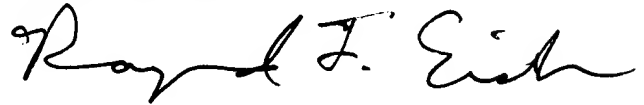
As stated above, the present claims recite hydrogenation of the polyalphaolefin such that the polyalphaolefin of the present claims is no more than about 0.036% unsaturated (i.e., the polyalphaolefin has a Bromine Index of 200 or less). Neither Cupples nor Sauer teach or suggest hydrogenating to such a low level of unsaturation, for the reasons described above. In addition, Fear neither teaches nor suggests hydrogenating to such a low Bromine Index.

Because neither Cupples, Sauer, nor Fear teaches or suggests hydrogenating a polyalphaolefin to a Bromine Index of 200 or less, their combination cannot teach or suggest such a method step either. Therefore, claim 25 is patentable over Cupples, Sauer, and Fear, and the rejection of this claim should be withdrawn.

6. Conclusion

The Examiner is invited to contact the undersigned agent at (713) 934-4065 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,



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Appendix

Amended Claims

25. (Amended) A method of producing a composition comprising a highly oxidatively stable polyalphaolefin and a diphenylamine antioxidant, comprising the step of hydrogenating polyalphaolefin to a level of hydrogenation in which an RBOT level of at least 2200 minutes is achieved [when diphenyl amine is used as an antioxidant].